Force and torque converter.

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Inventor(s): HILTON JOHN A
Applicant(s): HILTON JOHN A
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Abstract

A force and torque converter provides command signals representative of a translation applied force along X and Z axes and applied torques extending about X and Y axes. The apparatus comprises a body (9 or 30) to which the force and torque are applied, first and second connecting means (10A, 10B, 10C or 33A, 33B, 33C, 32A, 32B and 32) attached to the body, means for biasing (10A, 10B 10C, or 32A, 32B, 32C, or 36A and 36C) the connecting means to a central position and sensor means (2, 3, 5, or 39, 47) comprising two sensor devices arranged to detect a displacement force in each of the first and second connecting means respectively and which respond to the applied translation force and also respond to the torque to resolve the torque into a force comprising two components. A very important embodiment of the invention is arranged to operate in three dimensions and to resolve any applied torque and any applied trans-sectional force into respective components related to three mutually perpendicular axes (X, Y and Z). The apparatus can thus interpret operator applied hand signals on the body (9 or 30) for controlling an apparatus such as a computer based design system.